

MIL-STD-1623D(SH)
7 December 1981
SUPERSEDING
MIL-STD-1623C(SH)
21 April 1978

MILITARY STANDARD

FIRE PERFORMANCE REQUIREMENTS AND
APPROVED SPECIFICATIONS FOR INTERIOR
FINISH MATERIALS AND FURNISHINGS
(NAVAL SHIPBOARD USE)



MIL-STD-1623D(SH)
7 December 1981

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362

Fire Performance Requirements and Approved
Specifications for Interior Finish Materials
and Furnishings (Naval Shipboard Use)

MIL-STD-1623D(SH)

1. This Military Standard is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, Department of the Navy, Washington, DC 20362 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FOREWORD

The purpose of this standard is to establish fire performance criteria and provide a list of approved specifications for interior finish materials and furnishings to be used on Naval surface ships and submarines.

Although the development of limits for toxic products of combustion is of major concern, the information generally available is not refined to the degree to allow inclusion of finite limits in this standard at this time.

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MIL-STD-1623D(SH)
NOTICE 1
3 July 1985

MILITARY STANDARD

FIRE PERFORMANCE REQUIREMENTS AND APPROVED SPECIFICATIONS
FOR INTERIOR FINISH MATERIALS AND FURNISHINGS
(NAVAL SHIPBOARD USE)

TO ALL HOLDERS OF MIL-STD-1623D(SH):

1. THE FOLLOWING PAGES OF MIL-STD-1623D(SH) HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
3	3 July 1985	3	7 December 1981
4	7 December 1981	(REPRINTED WITHOUT CHANGE)	
7	7 December 1981	(REPRINTED WITHOUT CHANGE)	
8	3 July 1985	8	7 December 1981

2. Holders of MIL-STD-1623D(SH) will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the Military Standard is completely revised or canceled.

Preparing activity:
Navy - SH
(Project 19GP-N006)

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1. SCOPE AND APPLICATION

1.1 Scope. This standard provides fire performance requirements and approved specifications for seven categories of interior finish materials and furnishings for use on Naval surface ships and submarines.

1.2 Application. This standard applies to materials for bulkhead sheathing, overhead sheathing, furniture, draperies and curtains, deck coverings, thermal insulation and acoustic materials applications. The fire performance requirements of this standard supersede those contained in the applicable specifications.

2. REFERENCED DOCUMENTS

2.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this standard to the extent specified herein.

GOVERNMENTAL

SPECIFICATIONS

FEDERAL

- L-F-450 - Flooring, Vinyl Plastic.
- L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll) With Backing.
- L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride).
- HH-I-551 - Insulation Block and Boards, Thermal (Cellular Glass).
- SS-S-118 - Sound Controlling Blocks and Boards (Acoustical Tiles and Panels, Prefabricated).
- SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl-Asbestos.
- ZZ-M-42 - Mats, Floor, Dental-Chair, Rubber.
- CCC-A-680 - Artificial Leather (Cloth Coated), Vinyl Resin, Expanded Layer, (Upholstery).
- CCC-C-419 - Cloth, Duck, Cotton, Unbleached, Plied-yarns, Army and Numbered.
- CCC-C-426 - Cloth, Cotton, Drill.
- CCC-C-436 - Cloth, Ticking Twill, Cotton.
- CCC-C-700 - Cloth, Coated, Vinyl Coated (Artificial Leather).
- CCC-C-1703 - Cloth, Drapery, Glass Fiber.
- CCC-W-408 - Wall Covering, Vinyl-Coated.
- DDD-C-95 - Carpet and Rugs, Wool, Nylon, Acrylic, Modacrylic Polyester, Polypropylene.

MILITARY

- MIL-F-243 - Furniture, Shipboard, Steel, General Specification For.
- MIL-I-742 - Insulation Board, Thermal, Fibrous Glass.
- MIL-F-902 - Furniture, Shipboard, Aluminum, General Specification For.
- MIL-M-910 - Mats, Floor, Standing.
- MIL-I-2781 - Insulation, Pipe, Thermal.

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MILITARY - Continued

- MIL-I-2818 - Insulation Blanket, Thermal, Fibrous Mineral.
- MIL-I-2819 - Insulation Block, Thermal.
- MIL-D-3134 - Deck Covering Materials.
- MIL-D-3135 - Deck Covering Underlay Materials.
- MIL-P-15280 - Plastic Material, Unicellular (Sheets and Tubes).
- MIL-I-15475 - Insulation Felt, Thermal, Fibrous Glass Semirigid.
- MIL-M-15562 - Matting or Sheet, Floor Covering, Insulating for High Voltage Application.
- MIL-I-16411 - Insulation Felt, Thermal, Glass Fiber.
- MIL-D-16680 - Deck Covering Magnesia Aggregate Mixture.
- MIL-P-17171 - Plastic Laminate, Decorative, High Pressure.
- MIL-D-17951 - Deck Covering, Lightweight, Nonslip, Silicon Carbide Particle Coated Fabric, Film, or Composite, and Sealing Compound.
- MIL-T-18830 - Tile, Plastic, Fire-Retardant.
- MIL-D-18873 - Deck Covering Magnesia Aggregate Mixture.
- MIL-C-19565 - Coating Compounds, Thermal Insulation Pipe Covering - Fire- and Water-Resistant, Vapor-Barrier and Weather-Resistant.
- MIL-C-19993 - Coating Compound, Fibrous Glass Thermal Insulation Board, Water Vapor Barrier.
- MIL-C-20079 - Cloth, Glass; Tape, Textile, Glass; and Thread, Glass.
- MIL-R-20092 - Rubber Sheets and Molded Shapes, Cellular, Synthetic, Open Cell (Foamed Latex).
- MIL-G-20241 - Gasket Material, Wool Felt, Impregnated, Adhesive, Pressure-Sensitive.
- MIL-A-21016 - Adhesive, Resilient Deck Covering.
- MIL-D-21631 - Deck Covering, Latex Concrete.
- MIL-I-22023 - Insulation Felt, Thermal and Sound Absorbing Felt, Fibrous Glass, Flexible.
- MIL-I-22344 - Insulation, Pipe, Thermal, Fibrous Glass.
- MIL-C-22395 - Compound, End Sealing, Thermal Insulation Pipe Covering - Fire-, Water-, and Weather-Resistant.
- MIL-P-22581 - Plastic Sheet, Vibration Damping.
- MIL-D-23003 - Deck Covering Compound, Nonslip, Rollable.
- MIL-A-23054 - Acoustical Absorptive Board, Fibrous Glass, Perforated Fibrous Glass Cloth Faced.
- MIL-I-23128 - Insulation Blanket, Thermal, Refractory Fiber, Flexible.
- MIL-P-23653 - Plastic Tiles, Vibration Damping.
- MIL-S-24062 - Sprayable Vibration Damping Material for Light Steel Plate.

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MILITARY - Continued

- MIL-I-24172 - Insulation, Plastic, Cellular Polyurethane, Rigid, Preformed and Foam-in-Place.
- MIL-P-24191 - Plastic Sheet, Cast, Acrylic, Shipboard Application (Illumination and Signal Lighting).
- MIL-D-24483 - Deck Covering, Spray-On, Nonslip.
- MIL-C-24500 - Cloth, Drapery, Bunk Curtain, Slipcovers, and Label, Polyaramid and Polyaramid Novoloid Fiber Blends, Shipboard Use.
- MIL-L-24518 - Laminate, Vinyl Film-Aluminum, Decorative.
- MIL-D-24613 - Deck Covering Materials, Interior, Cosmetic Polymeric.

STANDARDS

FEDERAL

- FED-STD-191 - Textile Test Methods.
- FED-STD-372 - Test for Critical Radiant Flux of Carpet Flooring Systems (Flooring Radiant Panel Test).
- FED-STD-406 - Plastics: Methods of Testing.
- FED-STD-501 - Floor Coverings, Resilient, Nontextile: Sampling and Testing.

PUBLICATIONS

UNITED STATES COAST GUARD

U.S.C.G. 164.009 - Test for Incombustibility.

(Application for copies should be addressed to the U.S. Coast Guard quarters, 400 Seventh Street, S.W., Washington, DC 20591.)

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

NONGOVERNMENTAL

AMERICAN IRON AND STEEL INSTITUTE (AISI)

Steel Products Manual.

(Application for copies should be addressed to the American Iron and Institute, 1000 - 16th Street, N.W., Washington, DC 20036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 635 - Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- D 2843 - Density of Smoke from the Burning or Decomposition of Plastics.
- E 84 - Surface Burning Characteristics of Building Materials.

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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) - Continued

E 162 - Surface Flammability of Materials Using a Radiant Heat Energy Source.

E 662 - Specific Optical Density of Smoke Generated by Solid Materials.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Materials. Interior finish materials and furnishings shall meet the requirements set forth in table I. Thicknesses for bulkhead sheathing, overhead sheathing, and furniture indicate maximum limits in both application and fire tests.

TABLE I. Material requirements.

Category	Material	Specification	Fire test	Maximum test limits	
Bulkhead sheathing <u>1/</u>	High pressure laminate	MIL-P-17171, type IV	ASTM E 84	Flame spread	25
				Smoke developed	15
	Fabric-backed vinyl	CCC-W-408, type II	ASTM E 84	Flame spread	25
				Smoke developed	75
				Thickness	0.035 inch
	PVC film-aluminum laminate	MIL-L-24518	ASTM E 84	Flame spread	25
				Smoke developed	75
				Thickness film	0.011 inch
				Thickness aluminum	0.063 inch
	CRES panel	ANSI type 304, finish 4	Not required	Not required	
	High pressure laminate pre-bonded to aluminum	MIL-P-17171	ASTM E 84	Flame spread	25
				Smoke developed	15
				Thickness aluminum	0.050 inch
	PVF film-aluminum laminate	L-P-1040, type II, grade A, class 1	ASTM E 84	Flame spread	25
				Smoke developed	75
				Thickness film	0.004 inch maximum
				Thickness aluminum	0.063 inch

See footnotes at end of table.

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TABLE I. Material requirements. - Continued

Category	Material	Specification	Fire test	Maximum test limits	
Overhead sheathing ^{2/}	Fibrous glass opaque suspended ceiling panel	SS-S-118, type III	ASTM E 84	Flame spread	25
				Smoke developed	35
				Thickness	0.750 inch
	Acrylic light-diffusing panel/windows (lighting fixture only) ^{3/}	MIL-P-24191	ASTM D 635 ASTM D 2843	1.35 in/min. Optical smoke density	50
				Thickness	0.250 inch
	PVC film-aluminum laminate	MIL-L-24518	ASTM E 84	Flame spread	25
Furniture				Smoke developed	75
				Thickness film	0.011 inch
				Thickness aluminum	0.063 inch
	CRES panel	ANSI type 304, finish 4	Not required	Not required	
	Aluminum exposed grid suspension framework	Commercial	Not required	Not required	
	PVC film-aluminum-laminate	L-P-1040, type II, grade A, class 1	ASTM E 84	Flame spread	25
				Smoke developed	75
				Film thickness	0.004 inch
				Thickness aluminum	0.05 inch
	Vinyl upholstery	CCC-A-680, class 2, treatment (a) 1	FED-STD-191, method 5903	Char length After flame	3 inch 2 sec
	Vinyl upholstery	CCC-C-700, class 4, treatment a	FED-STD-191, method 5903	Char length After flame	3 inch 2 sec

See footnotes at end of table.

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TABLE I. Material requirements. - Continued

Catetory	Material	Specification	Fire test	Maximum test limits	
Furniture - continued	Aromatic poly-amide upholstery	Commercial	FED-STD-191, method 5903	Char length After flame	5 inch 1 sec
	Treated ^{3/} cotton mattress ticking (non-launderable)	CCC-C-436, type II, class 2	FED-STD-191, method 5903	Char length After flame	5 inch 2 sec
	Cotton duck ^{4/} berth-spring unit mattress cover, treated (launderable)	CCC-C-419, type I, No. 10	FED-STD-191, method 5903	Char length After flame	5 inch 2 sec
	Cotton drill mattress cover (launderable)	CCC-C-426 type I class 2	FED-STD-191 method 5903	Char length After flame	5 inch 2 sec
	Aluminum	MIL-F-902	Not required	Not required	
	Steel	MIL-F-243	Not required	Not required	
	Polychloroprene cushioning and mattresses	MIL-R-20092, type II, class 5	ASTM E 162 ASTM E 662	Flame spread D _m corrected	10 200
	High pressure laminate for table tops ^{5/}	MIL-P-17171, type I	ASTM E 84	Flame spread Smoke developed Thickness	75 50 0.062 inch
Draperies and curtains ^{6/}	Fibrous glass	CCC-C-1703	FED-STD-191, method 5903 ASTM E 662	Char length After flame After glow D _m corrected	1.5 inch 1 sec 2 sec 20

See footnotes at end of table.

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TABLE I. Material requirements. - Continued

Category	Material	Specification	Fire test	Maximum test limits	
Draperies and curtains ^{6/} continued	Polyaramid	MIL-C-24500, type I	FED-STD-191, method 5903 ASTM E 662	Char length	5 inch
				After flame	1 sec
				After glow	25 sec
				D _m corrected	20
	Polyaramid/ Novoloid	MIL-C-24500, type II	FED-STD-191, method 5903 ASTM E 662	Char length	3 inch
				After flame	1 sec
				After glow	25 sec
				D _m corrected	20
Deck coverings ^{8/}	Fire-retardant plastic	MIL-T-18830 <u>7/</u>	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 inch
	Vinyl tile	SS-T-312, <u>7/</u> type III	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Vinyl sheet	L-F-450 <u>7/</u>	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Rubber tile	SS-T-312, <u>7/</u> type II	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Vinyl tile or sheet with backing	L-F-475 <u>7/</u>	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Threads non-skid	MIL-D-17951	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Epoxy non-skid	MIL-D-23003	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Latex underlay	MIL-D-3135	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min
	Terrazzo	MIL-D-3134, type I, class 1, type I, class 2	FED-STD-501, method 6411	Char length	10 inch
				Combustion time	4.0 min

See footnotes at end of table.

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Category	Material	Specification	Fire test	Maximum test limits
Deck coverings ^{8/} continued	Latex mastic	MIL-D-3134, type II	FED-STD-501, method 6411	Char length 10 inch Combustion time 4.0 min
	Latex concrete	MIL-D-21631	FED-STD-501, method 6411	Char length 3 inch Combustion time 4.0 min
	Magnesium aggregate	MIL-D-16680 and MIL-D-18873	FED-STD-501, method 6411	Char length 3 inch Combustion time 4.0 min
	Standing rubber mat	MIL-M-910	Not required	Not required
	Electrical grade mat or sheet	MIL-M-15562 ^{7/}	FED-STD-501, method 6411	Char length 10 inch Combustion time 4.0 min
	Carpet	DDD-C-95, type II, class 1, 2, or 4	FED-STD-372 ASTM E 662	Incident radiant energy 0.5 watts/cm ² (minimum) D _m corrected 450
	Spray-on non-skid	MIL-D-24483	FED-STD-501, method 6411	Char length 10 inch Combustion time 4.0 min
	Barber shop mat	ZZ-M-42	Not required	Not required
	Interior ⁹ cosmetic polymeric	MIL-D-24613	FED-STD-501, method 6411	Char length 10 inch Combustion time 4.0 min

See footnotes at end of table.

Supersedes page 8 of 7 December 1981.

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TABLE I. Material requirements. - Continued

Category	Material	Specification	Fire test	Maximum test limits	
Thermal insulation ^{9/}	Insulating board	MIL-I-742 type I	ASTM E 84	Flame spread	25
				Smoke developed	10
		Core only	U.S.C.G. 164.009	Thickness	1 inch
		Type II	U.S.C.G. 164.009	Pass	
	Pipe insulation	MIL-I-2781	ASTM E 84	Flame spread	0
				Smoke developed	0
	Block insulation	MIL-I-2819	ASTM E 84	Flame spread	0
				Smoke developed	0
	Insulating blanket	MIL-I-23128	U.S.C.G. 164.009	Pass	
	Insulating felt	MIL-I-16411	U.S.C.G. 164.009	Pass	
	Insulating block	HH-I-551	U.S.C.G. 164.009	Pass	
	Insulating blanket	MIL-I-2818	U.S.C.G. 164.009	Pass	
	Insulating felt	MIL-I-15475	U.S.C.G. 164.009	Pass	
	Weather resistant coating compound ^{10/}	MIL-C-19565			
	Fibrous glass coating compound ^{10/}	MIL-C-19993			

See footnotes at end of table.

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TABLE I. Material requirements. - Continued

Category	Material	Specification	Fire test	Maximum test limits
Thermal insulation ^{9/} - continued	Glass cloth	MIL-C-20079, type I (all classes) Before & after treatment type II (all classes) Before & after treatment	See applicable specification	Pass
	Pipe insulation	MIL-I-22344	ASTM E 84	Flame spread 25 Smoke developed 50
	Urethane foam ^{10/} (Reefer spaces only)	MIL-I-24172		
	End sealer ^{10/}	MIL-C-22395		
	PVC - Nitrile	MIL-P-15280	ASTM E 84 ASTM E 662	Flame spread 25 D corrected 250 Thickness 0.5 inch

^{1/} Maximum test limits are based upon material bonded to a non-combustible substrate.^{2/} Maximum test limits are based upon material attached to, or supported by, a non-combustible substrate.^{3/} Use restricted to mattresses only.^{4/} Use restricted to Officers' Berths.^{5/} Wherever a flame spread higher than 25 is indicated, the material is acceptable since there is no other acceptable material available with a lower flame spread.^{6/} An 8-ounce weight shall be used for materials tested in accordance with method 5903 of FED-STD-191.^{7/} Cement test specimen with MIL-A-21016. Permit cement to dry a minimum of 72 hours before conducting fire test.

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- 8/ Materials tested in accordance with method 6411 of FED-STD-501 shall exhibit ignition time no less than 20 seconds. Ignition time is defined as the time in seconds from the initial application of the burners on the sample until the first self-sustaining flame (ignition) is observed issuing from the top surface of the sample.
- 9/ Materials tested in accordance with U.S.C.G. 164.009 shall pass all requirements for incombustibility.
- 10/ Where no fire test limits appear, technical data was not available as of the date of this standard. However, the specifications listed are the only materials available.

4. FIRE TEST PROVISIONS

4.1 Responsibility for testing. Unless otherwise required in the applicable material specification, the manufacturer is responsible for conducting fire tests as specified herein. Except as otherwise specified, the manufacturer may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the tests set forth herein where such testing is deemed necessary to assure compliance to prescribed requirements.

4.2 Methods of testing. Fire tests shall be conducted on materials as specified in table I and the notes therein. All fire test procedures shall be in accordance with prescribed standards and test methods, and, unless otherwise specified herein, no less than three specimens shall be tested on material of the same lot with results averaged (arithmetic means). The following tests apply:

4.2.1 Surface flammability.

- 4.2.1.1 ASTM E 84 (Tunnel test).
- 4.2.1.2 ASTM E 162 (Radiant panel).
- 4.2.1.3 FED-STD-501, method 6411.
- 4.2.1.4 FED-STD-372.
- 4.2.1.5 ASTM D 635.

4.2.2 Vertical flame resistance.

4.2.2.1 FED-STD-191, method 5903 - A minimum of five specimens from each of the warp and filling directions on material of the same lot shall be tested and their results averaged (arithmetic means).

4.2.3 Smoke generation.

- 4.2.3.1 ASTM E 84 (Tunnel test).
- 4.2.3.2 ASTM E 662.
- 4.2.3.3 ASTM D 2843.

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4.2.4 Test for inc combustibility.

4.2.4.1 U.S.C.G. 164.009 (Heated Tube Test).

5. NOTES

5.1 This standard will be updated periodically as additional data becomes available.

5.2 Approved adhesives were not considered a fire hazard and the category was deleted from this standard.

5.3 This standard will be implemented by the requirements of the applicable material specifications.

5.4 The materials specified in this standard reflect the present state-of-the-art.

Preparing activity:
Navy - SH
(Project 19GP-N004)